



**YG**  
**V7 Plus**

*HIGH PERFORMANCE  
SOLID CARBIDE END MILLS*

For Steels, Cast Iron and Stainless Steels

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**BROTECH**



## PRODUCT FEATURES



- Chatter and Harmonics Reduced for **Improved Stability and Better Finishing**
- Special Design of Flute Geometry for **Optimal Chip Formation and Chip Evacuation**
- Engineered Coating Technology to **Reduced Wear and Increase Heat Resistance**
- Enhanced Corner Geometry for **Longer Tool Life**

## PRODUCT GEOMETRY

### Corner Geometries

YG-1's High Performance Corner Geometries Including Corner Radius, applied for Longer Tool Life with Higher Cutting Speed and Heavy Cutting

### Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent Chip Evacuation with Better Surface Finish

### Multiple Helix

Multiple Helix Designed for Optimal Chip Formation and Chip Evacuation Concluding Faster and Heavier Cutting making Higher Productivity

### Ultra Micro grain Carbide

Premium Carbide Substrate Achieving Exceptional Wear Resistance

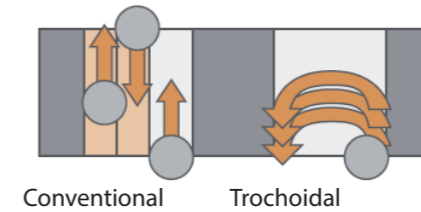
## V7 PLUS 6 FLUTE END MILLS



### THE BEST CHATTER FREE TOOL FOR HIGH SPEED

- Unique geometry of the variable pitch provides the best chatter free tool for high speed and also trochoidal milling
- Several slot widths can be used with the same tool diameter in an efficient way
- Provides longer tool life and higher productivity on most materials
- Trochoidal milling is a programming technique applying a small radial width of cut with also higher cutting speed and feed per tooth

### Trochoidal Milling performs better than conventional ways because it has..



- Lower Cutting Force from smaller arc engagement
- Longer Tool Life from more flutes, and deeper cutting depth
- Higher Stability, Lower Vibration and Excellent Chip Evacuation

## V7 PLUS 6 FLUTE CHIP SPLITTER NEW

### Corner Geometries

YG-1's High Performance Corner Geometries Including Corner Radius, applied for Longer Tool Life with Higher Cutting Speed

### Unequal Index

Exclusively Designed Unique Geometry applied to Reduce Vibration and also to achieve Excellent Surface Finish

### Chip Splitters

Special Chip Splitter Design Shorter Chip Length at High Axial Machining, improving Chip Removal from both the Component and the Machine

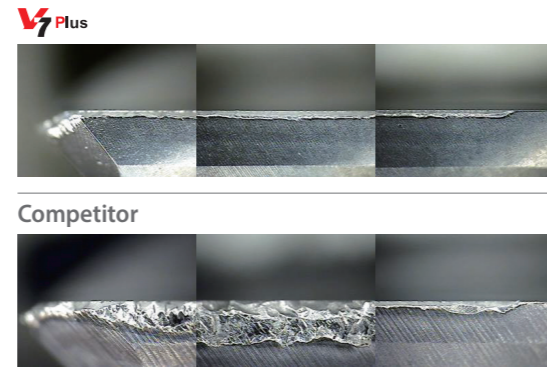
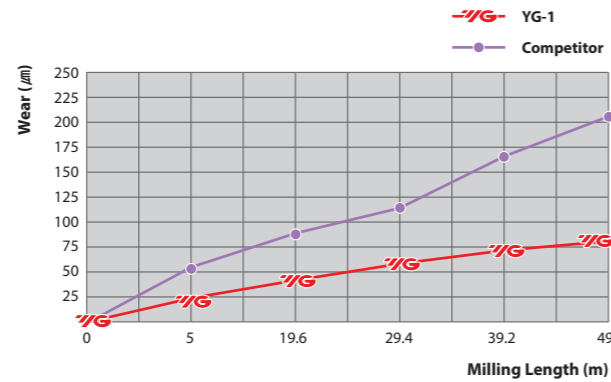
### GUIDE LINE TO ICONS

<b>Tool Raw Material</b> CARBIDE	<b>Helix Angle</b> 35°/37° 35°/37° 41°~45° 45°	<b>No. of Flutes</b> 4 5 6	
<b>Tolerance of Ball Radius</b> R ±0.02	<b>Type of Shank</b> PLAIN FLAT	<b>Chamfer Angle</b> C x 45°	<b>Cutting Condition Pages</b>

## CASE STUDY

### V7 Plus 4 Flute vs Competitor

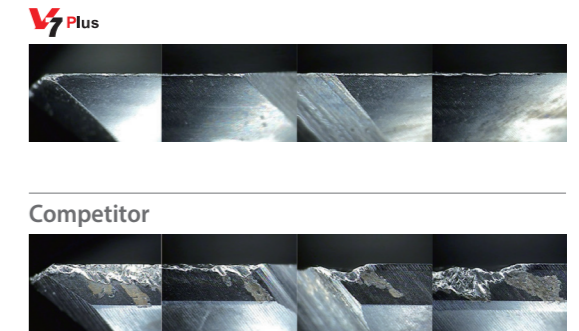
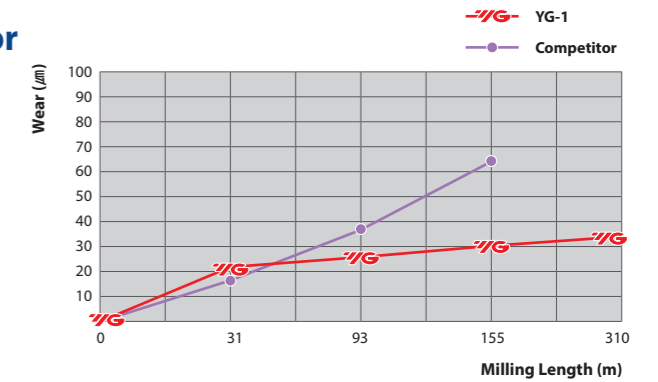
	V7 Plus	Competitor
Wear(μm)	<b>83.518</b>	<b>203.381</b>
Milling Length(m)	49	49
Size(mm)	Ø10 x Ø10 x 22 x 72	
Work Material	-DIN: C45 -WR: 1.0503 -JIS: S45C (HRc 30 / HB 286)	
Cutting Speed	230.09 m/min.	
RPM	7,324 rev./min.	
Feed	1,464 mm/min.	
Feed per tooth	0.05 mm/tooth	
Milling Method	Down & Side Cutting	
Milling Depth	Axial: 10 mm, Radial: 3 mm	
Coolant	Wet Cut	
Overhang	34 mm	
Machine	Machining Center	



## CASE STUDY

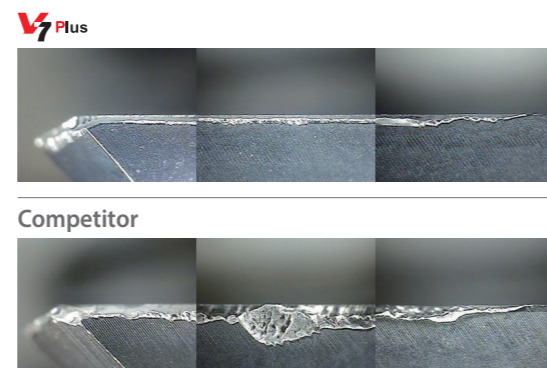
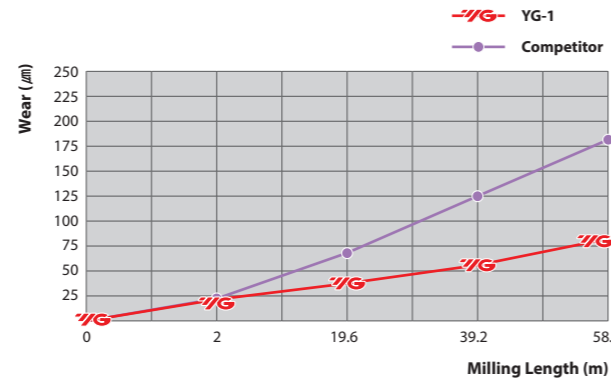
### V7 Plus 6 Flute Chip Splitter vs Competitor

	V7 Plus	Competitor
Wear(μm)	<b>32.49</b>	<b>88.26</b>
Milling Length(m)	310	155
Size(mm)	Ø12 x Ø12 x 48 x 120 with chip Splitter	
Work Material	-DIN: C45 -WR: 1.0503 -JIS: S45C (HRc 30 / HB 286)	
Cutting Speed	220.01 m/min.	
RPM	5,836 rev./min.	
Feed	3,151 mm/min.	
Milling Method	Trochoidal Cutting	
Milling Depth	Axial: 36mm, Radial: 0.6 mm	
Coolant	Wet Cut	
Overhang	56 mm	
Machine	Machining Center	



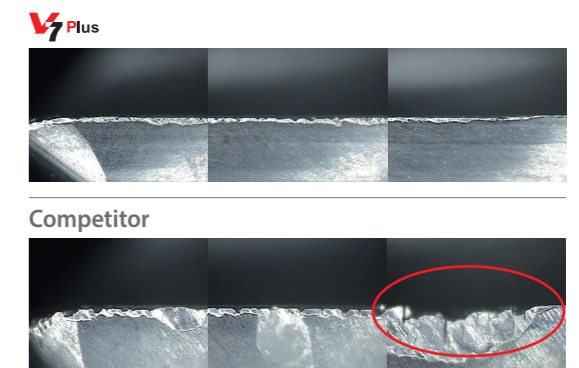
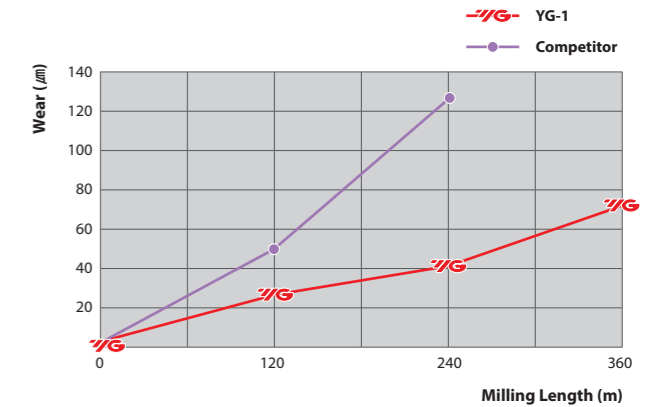
### V7 Plus 4 Flute vs Competitor

	V7 Plus	Competitor
Wear(μm)	<b>81.485</b>	<b>183.296</b>
Milling Length(m)	58.8	58.8
Size(mm)	Ø16 x Ø16 x 32 x 92	
Work Material	-DIN: C45 -WR: 1.0503 -JIS: S45C (HRc 30 / HB 286)	
Cutting Speed	160.00 m/min.	
RPM	3,183 rev./min.	
Feed	573 mm/min.	
Feed per tooth	0.05 mm/tooth	
Milling Method	Down & Side Cutting	
Milling Depth	Axial: 14 mm, Radial: 3 mm	
Coolant	Wet Cut	
Overhang	45 mm	
Machine	Machining Center	



### V7 Plus 6 Flute vs Competitor

	V7 Plus	Competitor
Milling Length(m)	<b>360</b>	<b>300</b>
Size(mm)	Ø12(R1) x Ø12 x 26 x 83	
Work Material	-DIN: C45 -WR: 1.0503 -JIS: S45C (HRc 30 / HB 286)	
Cutting Speed	278.67 m/min.	
RPM	7,392 rev./min.	
Feed	7,495 mm/min.	
Feed per tooth	0.17 mm/tooth	
Milling Method	Trochoidal Cutting	
Milling Depth	Axial: 24 mm(2D), Radial: 0.6 mm(0.05D)	
Coolant	Wet Cut	
Overhang	36 mm	
Machine	Machining Center	





# SELECTION GUIDE



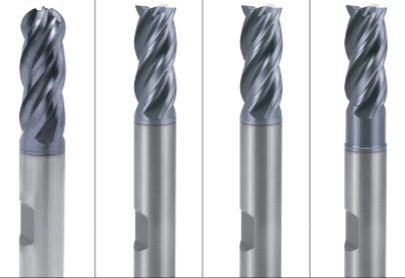
HIGH PERFORMANCE  
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◎ : Excellent ○ : Good

ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment	HB	HRc	GMG55 GMG56	GMF54 GMF55	GMF58 GMF59	GMF62 GMF63
P	1	Non-alloy steel	About 0.15% C Annealed	125		◎	◎	◎	◎
	2		About 0.45% C Annealed	190	13	◎	◎	◎	◎
	3		About 0.45% C Quenched & tempered	250	25	◎	◎	◎	◎
	4		About 0.75% C Annealed	270	28	◎	◎	◎	◎
	5		About 0.75% C Quenched & tempered	300	32	◎	◎	◎	◎
	6	Low alloy steel	Annealed	180	10	◎	◎	◎	◎
	7		Quenched & tempered	275	29	◎	◎	◎	◎
	8		Quenched & tempered	300	32	◎	◎	◎	◎
	9		Quenched & tempered	350	38	◎	◎	◎	◎
	10		High alloyed steel, and tool steel	Annealed	200	15	◎	◎	◎
	11	Quenched & Tempered		325	35	◎	◎	◎	◎
M	12	Stainless steel	Ferritic / Martensitic Annealed	200	15	◎	◎	◎	◎
	13		Martensitic Quenched & Tempered	240	23	◎	◎	◎	◎
	14		Austenitic	180	10	◎	◎	◎	◎
K	15	Grey cast iron	Pearlitic / ferritic	180	10	◎	◎	◎	◎
	16		Pearlitic (Martensitic)	260	26	◎	◎	◎	◎
	17	Nodular cast iron	Ferritic	160	3	◎	◎	◎	◎
	18		Pearlitic	250	25	◎	◎	◎	◎
	19		Ferritic	130		◎	◎	◎	◎
20	Malleable cast iron	Pearlitic	230	21	◎	◎	◎	◎	
N	21	Aluminum-wrought alloy	Not Curable	60					
	22		Curable Hardened	100					
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable	75					
	24		≤ 12% Si, Curable Hardened	90					
	25		> 12% Si, Not Curable	130					
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%	110					
	27		CuZn, CuSnZn (Brass)	90					
	28		CuSn, lead-free copper and electrolytic copper	100					
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic						
	30		Rubber, Wood, etc.						
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15	○	○	○
	32			Cured	280	30	○	○	○
	33		Ni or Co Based	Annealed	250	25	○	○	○
	34			Cured	350	38	○	○	○
	35			Cast	320	34	○	○	○
	36	Titanium Alloys	Pure Titanium	400 Rm		○	○	○	
	37		Alpha + Beta Alloys	Hardened	1050 Rm		○	○	
H	38	Hardened steel	Hardened	550	55				
	39		Hardened	630	60				
	40		Chilled Cast Iron	Cast	400	42			
	41		Hardened Cast Iron	Hardened	550	55			

SERIES	GMG55 GMG56	GMF54 GMF55	GMF58 GMF59	GMF62 GMF63
FLUTE	4	4	4	4
HELIX ANGLE	35°/37°	35°/37°	35°/37°	35°/37°
CUTTING EDGE SHAPE	BALL NOSE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS
SIZE MIN	R1.5	D3.0	D3.0	D3.0
SIZE MAX	R12.5	D20.0	D25.0	D20.0
PAGE	8	9	10	11

	LONG LENGTH	SHORT LENGTH	LONG LENGTH	LONG LENGTH with NECK
	Y-Coating	Y-Coating	Y-Coating	Y-Coating



GMF52 GMF53	GMF56 GMF57	GMF60 GMF61	GMG16 GMG17	GMG18 GMG19	GMH58 GMH59	GMG12 GMG13	GMG14 GMG15	GMH56 GMH57	EMB72 EMB73
4	4	4	6	6	6	6	6	6	5
35°/37°	35°/37°	35°/37°	45°	45°	45°	45°	45°	45°	41°~45°
SQUARE	SQUARE	SQUARE	CORNER RADIUS	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE	SQUARE	SQUARE
D3.0	D3.0	D3.0	D6.0	D6.0	D6.0	D6.0	D6.0	D6.0	D6.0
D20.0	D25.0	D20.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0	D25.0
14	15	16	18	19	21	23	24	25	26
SHORT LENGTH	LONG LENGTH	LONG LENGTH with NECK	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH	EXTRA LONG LENGTH	EXTRA LONG LENGTH	LONG LENGTH
Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	Y-Coating	AlTiN



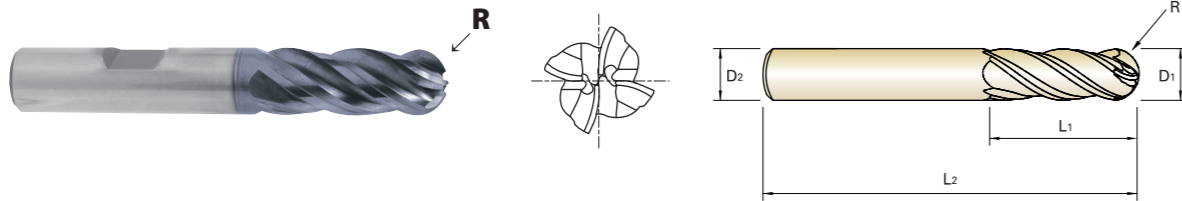
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											41



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE BALL NOSE

**GMG55** PLAIN SHANK  
**GMG56** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

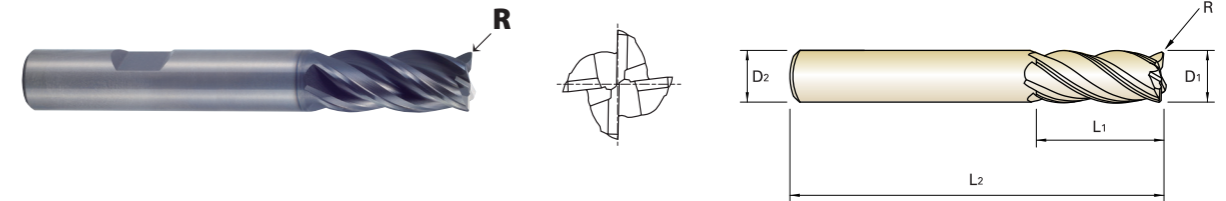
EDP No.		Radius of Ball Nose	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R (±0.02)	D1	D2	L1	L2
GMG55030	GMG56030	R1.5	3.0	6	8	57
GMG55040	GMG56040	R2.0	4.0	6	11	57
GMG55050	GMG56050	R2.5	5.0	6	13	57
GMG55060	GMG56060	R3.0	6.0	6	13	57
GMG55080	GMG56080	R4.0	8.0	8	19	63
GMG55100	GMG56100	R5.0	10.0	10	22	72
GMG55120	GMG56120	R6.0	12.0	12	26	83
GMG55160	GMG56160	R8.0	16.0	16	32	92
GMG55200	GMG56200	R10.0	20.0	20	38	104
GMG55250	GMG56250	R12.5	25.0	25	38	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5
Over Ø12	0 ~ -0.03	* Shank Dia. ≥ Ø12: h6

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS SHORT LENGTH

**GMF54** PLAIN SHANK  
**GMF55** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
GMF54030	GMF55030	R0.3	3.0	6	7	54
GMF54901	GMF55901	R0.5	3.0	6	7	54
GMF54040	GMF55040	R0.3	4.0	6	8	54
GMF54902	GMF55902	R0.5	4.0	6	8	54
GMF54050	GMF55050	R0.3	5.0	6	10	54
GMF54903	GMF55903	R0.5	5.0	6	10	54
GMF54060	GMF55060	R0.3	6.0	6	10	54
GMF54904	GMF55904	R0.5	6.0	6	10	54
GMF54905	GMF55905	R1.0	6.0	6	10	54
GMF54080	GMF55080	R0.5	8.0	8	12	58
GMF54906	GMF55906	R1.0	8.0	8	12	58
GMF54100	GMF55100	R0.5	10.0	10	14	66
GMF54907	GMF55907	R1.0	10.0	10	14	66
GMF54120	GMF55120	R0.5	12.0	12	16	73
GMF54908	GMF55908	R1.0	12.0	12	16	73
GMF54909	GMF55909	R2.0	12.0	12	16	73
GMF54140	GMF55140	R0.5	14.0	14	18	75
GMF54160	GMF55160	R1.0	16.0	16	22	82
GMF54912	GMF55912	R2.0	16.0	16	22	82
GMF54913	GMF55913	R3.0	16.0	16	22	82
GMF54180	GMF55180	R1.0	18.0	18	24	84
GMF54200	GMF55200	R1.0	20.0	20	26	92
GMF54916	GMF55916	R2.0	20.0	20	26	92
GMF54917	GMF55917	R3.0	20.0	20	26	92

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02	h5
Over Ø12	0 ~ -0.03	* Shank Dia. ≥ Ø12: h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34						15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

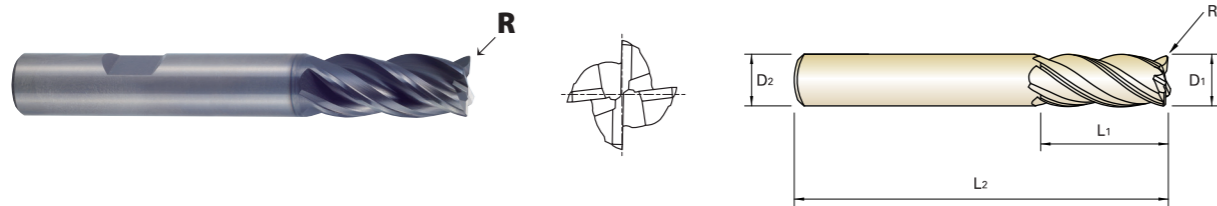
ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34						15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS LONG LENGTH

**GMF58 PLAIN SHANK**  
**GMF59 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
GMF58030	GMF59030	R0.3	3.0	6	8	57
GMF58901	GMF59901	R0.5	3.0	6	8	57
GMF58040	GMF59040	R0.3	4.0	6	11	57
GMF58902	GMF59902	R0.5	4.0	6	11	57
GMF58050	GMF59050	R0.3	5.0	6	13	57
GMF58903	GMF59903	R0.5	5.0	6	13	57
GMF58060	GMF59060	R0.3	6.0	6	13	57
GMF58904	GMF59904	R0.5	6.0	6	13	57
GMF58905	GMF59905	R1.0	6.0	6	13	57
GMF58080	GMF59080	R0.5	8.0	8	19	63
GMF58906	GMF59906	R1.0	8.0	8	19	63
GMF58100	GMF59100	R0.5	10.0	10	22	72
GMF58907	GMF59907	R1.0	10.0	10	22	72
GMF58120	GMF59120	R0.5	12.0	12	26	83
GMF58908	GMF59908	R1.0	12.0	12	26	83
GMF58909	GMF59909	R2.0	12.0	12	26	83
GMF58140	GMF59140	R0.5	14.0	14	26	83
GMF58160	GMF59160	R1.0	16.0	16	32	92
GMF58912	GMF59912	R2.0	16.0	16	32	92
GMF58913	GMF59913	R3.0	16.0	16	32	92
GMF58180	GMF59180	R1.0	18.0	18	32	92
GMF58200	GMF59200	R1.0	20.0	20	38	104
GMF58916	GMF59916	R2.0	20.0	20	38	104
GMF58917	GMF59917	R3.0	20.0	20	38	104
GMF58250	GMF59250	R1.0	25.0	25	38	104

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02 h5
Over Ø12	0 ~ - 0.03 * Shank Dia. ≥ Ø12: h6

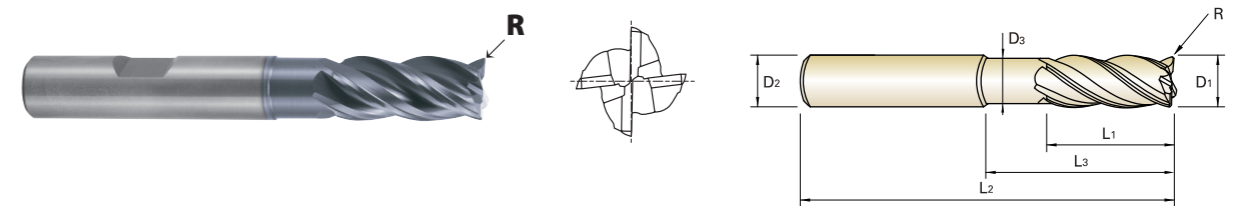
◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	38	10	29	32	38	45	15	35	40	48	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	400	200	325	200	240	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62 PLAIN SHANK**  
**GMF63 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R	D1	D2	L1	L3	L2	D3
GMF62030	GMF63030	R0.3	3.0	6	7	12	54	2.7
GMF62901	GMF63901	R0.5	3.0	6	7	12	54	2.7
GMF62902	GMF63902	R0.3	3.0	6	7	17	57	2.7
GMF62903	GMF63903	R0.5	3.0	6	7	17	57	2.7
GMF62040	GMF63040	R0.3	4.0	6	8	15	57	3.7
GMF62904	GMF63904	R0.5	4.0	6	8	15	57	3.7
GMF62905	GMF63905	R0.3	4.0	6	8	22	63	3.7
GMF62906	GMF63906	R0.5	4.0	6	8	22	63	3.7
GMF62050	GMF63050	R0.3	5.0	6	10	17	57	4.7
GMF62907	GMF63907	R0.5	5.0	6	10	17	57	4.7
GMF62908	GMF63908	R0.3	5.0	6	10	27	67	4.7
GMF62909	GMF63909	R0.5	5.0	6	10	27	67	4.7
GMF62060	GMF63060	R0.3	6.0	6	10	15	57	5.5
GMF62910	GMF63910	R0.5	6.0	6	10	15	57	5.5
GMF62911	GMF63911	R1.0	6.0	6	10	15	57	5.5
GMF62912	GMF63912	R0.3	6.0	6	10	20	62	5.5
GMF62913	GMF63913	R0.5	6.0	6	10	20	62	5.5
GMF62914	GMF63914	R1.0	6.0	6	10	20	62	5.5
GMF62915	GMF63915	R0.3	6.0	6	10	32	74	5.5
GMF62916	GMF63916	R0.5	6.0	6	10	32	74	5.5
GMF62917	GMF63917	R1.0	6.0	6	10	32	74	5.5
GMF62080	GMF63080	R0.5	8.0	8	12	20	63	7.5
GMF62918	GMF63918	R1.0	8.0	8	12	20	63	7.5
GMF62919	GMF63919	R0.5	8.0	8	12	30	73	7.5

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Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02 h5
Over Ø12	0 ~ - 0.03 * Shank Dia. ≥ Ø12: h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K			H		
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron	Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
HRC	13	25	28	32	38	10	29	32	38	45	15	35	40	48	10	26	3	25	21	21
HB	125	190	250	270	300	180	275	300	350	400	200	325	200	240	180	260	160	250	130	230
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

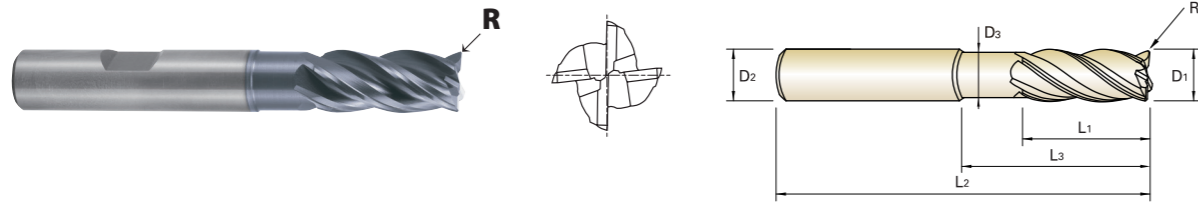




## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62** PLAIN SHANK  
**GMF63** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R	D1	D2	L1	L3	L2	D3
GMF62920	GMF63920	R1.0	8.0	8	12	30	73	7.5
GMF62921	GMF63921	R0.5	8.0	8	12	46	90	7.5
GMF62922	GMF63922	R1.0	8.0	8	12	46	90	7.5
GMF62100	GMF63100	R0.5	10.0	10	14	25	72	9.2
GMF62923	GMF63923	R1.0	10.0	10	14	25	72	9.2
GMF62924	GMF63924	R0.5	10.0	10	14	35	82	9.2
GMF62925	GMF63925	R1.0	10.0	10	14	35	82	9.2
GMF62926	GMF63926	R0.5	10.0	10	14	55	102	9.2
GMF62927	GMF63927	R1.0	10.0	10	14	55	102	9.2
GMF62120	GMF63120	R0.5	12.0	12	16	30	83	11.0
GMF62928	GMF63928	R1.0	12.0	12	16	30	83	11.0
GMF62929	GMF63929	R2.0	12.0	12	16	30	83	11.0
GMF62930	GMF63930	R0.5	12.0	12	16	40	93	11.0
GMF62931	GMF63931	R1.0	12.0	12	16	40	93	11.0
GMF62932	GMF63932	R2.0	12.0	12	16	40	93	11.0
GMF62933	GMF63933	R0.5	12.0	12	16	64	117	11.0
GMF62934	GMF63934	R1.0	12.0	12	16	64	117	11.0
GMF62935	GMF63935	R2.0	12.0	12	16	64	117	11.0
GMF62160	GMF63160	R1.0	16.0	16	22	38	92	15.0
GMF62936	GMF63936	R2.0	16.0	16	22	38	92	15.0
GMF62937	GMF63937	R3.0	16.0	16	22	38	92	15.0
GMF62938	GMF63938	R1.0	16.0	16	22	55	109	15.0
GMF62939	GMF63939	R2.0	16.0	16	22	55	109	15.0
GMF62940	GMF63940	R3.0	16.0	16	22	55	109	15.0

Unit : mm

▶ NEXT PAGE

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	45	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

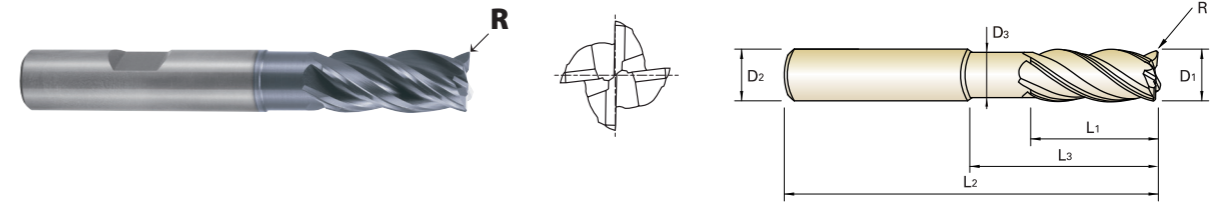
  

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	55	21	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE CORNER RADIUS WITH NECK

**GMF62** PLAIN SHANK  
**GMF63** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
PLAIN	FLAT	R	D1	D2	L1	L3	L2	D3
GMF62941	GMF63941	R1.0	16.0	16	22	87	141	15.0
GMF62942	GMF63942	R2.0	16.0	16	22	87	141	15.0
GMF62943	GMF63943	R3.0	16.0	16	22	87	141	15.0
GMF62200	GMF63200	R1.0	20.0	20	26	50	104	19.0
GMF62944	GMF63944	R2.0	20.0	20	26	50	104	19.0
GMF62945	GMF63945	R3.0	20.0	20	26	50	104	19.0
GMF62946	GMF63946	R1.0	20.0	20	26	70	124	19.0
GMF62947	GMF63947	R2.0	20.0	20	26	70	124	19.0
GMF62948	GMF63948	R3.0	20.0	20	26	70	124	19.0
GMF62949	GMF63949	R1.0	20.0	20	26	110	164	19.0
GMF62950	GMF63950	R2.0	20.0	20	26	110	164	19.0
GMF62951	GMF63951	R3.0	20.0	20	26	110	164	19.0

Unit : mm

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	45	15	35	15	23	10	10	26	3	25	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

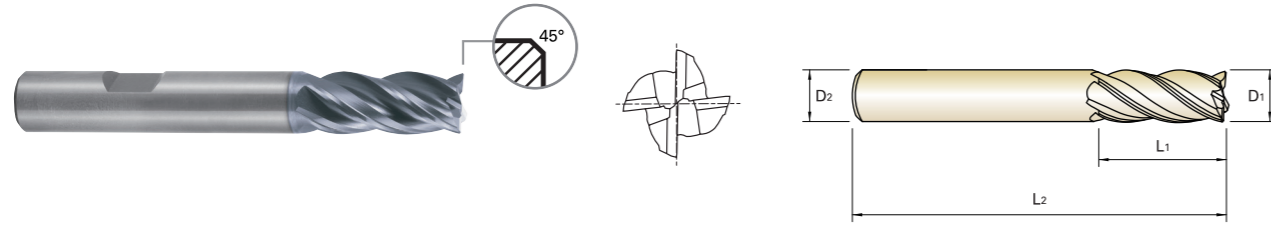
ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	55	21	
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE SHORT LENGTH

**GMF52 PLAIN SHANK**  
**GMF53 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40

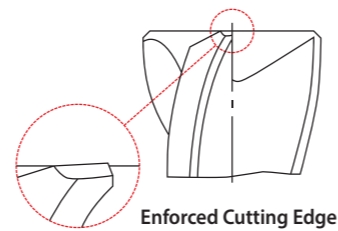


Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
GMF52030	GMF53030	3.0	6	7	54	0.10
GMF52040	GMF53040	4.0	6	8	54	0.15
GMF52050	GMF53050	5.0	6	10	54	0.15
GMF52060	GMF53060	6.0	6	10	54	0.20
GMF52080	GMF53080	8.0	8	12	58	0.20
GMF52100	GMF53100	10.0	10	14	66	0.30
GMF52120	GMF53120	12.0	12	16	73	0.35
GMF52140	GMF53140	14.0	14	18	75	0.40
GMF52160	GMF53160	16.0	16	22	82	0.40
GMF52180	GMF53180	18.0	18	24	84	0.50
GMF52200	GMF53200	20.0	20	26	92	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

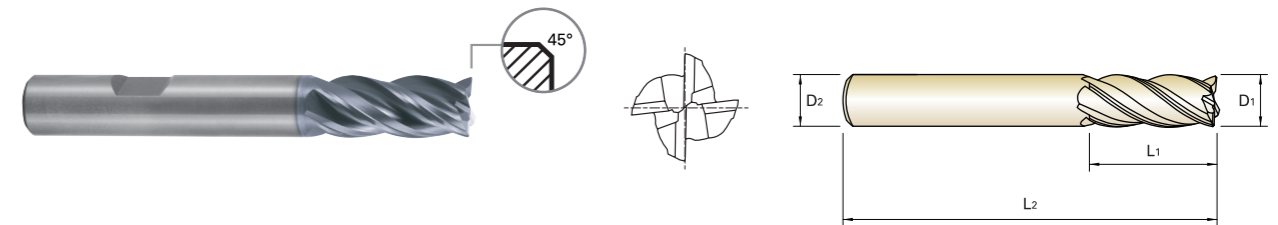
  

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE LONG LENGTH

**GMF56 PLAIN SHANK**  
**GMF57 FLAT SHANK**

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40

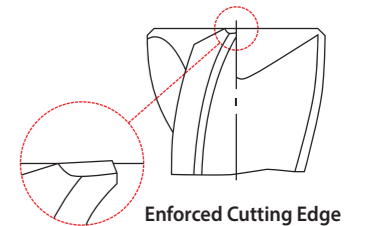


Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
GMF56030	GMF57030	3.0	6	8	57	0.10
GMF56040	GMF57040	4.0	6	11	57	0.15
GMF56050	GMF57050	5.0	6	13	57	0.15
GMF56060	GMF57060	6.0	6	13	57	0.20
GMF56080	GMF57080	8.0	8	19	63	0.20
GMF56100	GMF57100	10.0	10	22	72	0.30
GMF56120	GMF57120	12.0	12	26	83	0.35
GMF56140	GMF57140	14.0	14	26	83	0.40
GMF56160	GMF57160	16.0	16	32	92	0.40
GMF56180	GMF57180	18.0	18	32	92	0.50
GMF56200	GMF57200	20.0	20	38	104	0.50
GMF56250	GMF57250	25.0	25	38	104	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	30	10	29	32	38	15	35	15	23	10	10	26	3	25	21		
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

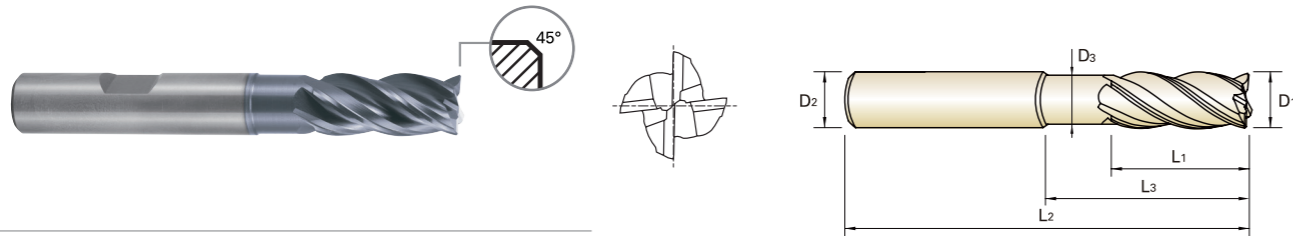
ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)				Non Metallic Materials		Heat Resistant Super Alloys		Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34	15	30	25	38	34	55	60	42	55		
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE with EXTENDED NECK

**GMF60** PLAIN SHANK  
**GMF61** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40

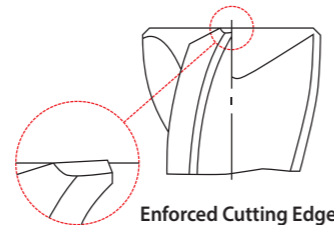


Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Chamfer
PLAIN	FLAT	D1	D2	L1	L3	L2	D3	
GMF60030	GMF61030	3.0	6	7	12	54	2.7	0.10
GMF60901	GMF61901	3.0	6	7	17	57	2.7	0.10
GMF60902	GMF61902	3.0	6	8	14	57	2.7	0.10
GMF60040	GMF61040	4.0	6	8	15	57	3.7	0.15
GMF60903	GMF61903	4.0	6	8	22	63	3.7	0.15
GMF60904	GMF61904	4.0	6	11	16	57	3.7	0.15
GMF60050	GMF61050	5.0	6	10	17	57	4.7	0.15
GMF60905	GMF61905	5.0	6	10	27	67	4.7	0.15
GMF60906	GMF61906	5.0	6	13	18	57	4.7	0.15
GMF60060	GMF61060	6.0	6	10	15	57	5.5	0.20
GMF60907	GMF61907	6.0	6	10	20	62	5.5	0.20
GMF60908	GMF61908	6.0	6	10	32	74	5.5	0.20
GMF60909	GMF61909	6.0	6	13	21	57	5.5	0.20
GMF60080	GMF61080	8.0	8	12	20	63	7.5	0.20
GMF60910	GMF61910	8.0	8	12	30	73	7.5	0.20
GMF60911	GMF61911	8.0	8	12	46	90	7.5	0.20
GMF60912	GMF61912	8.0	8	19	27	63	7.5	0.20
GMF60100	GMF61100	10.0	10	14	25	72	9.2	0.30
GMF60913	GMF61913	10.0	10	14	35	82	9.2	0.30
GMF60914	GMF61914	10.0	10	14	55	102	9.2	0.30
GMF60915	GMF61915	10.0	10	22	32	72	9.2	0.30

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6



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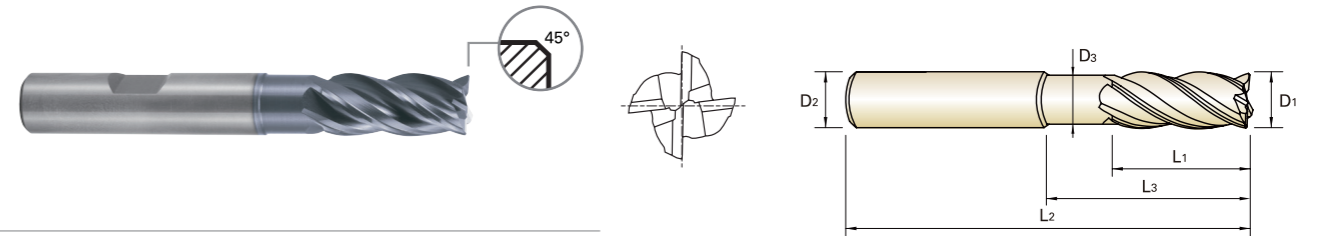
◎ : Excellent ○ : Good

ISO Material Description	P										M				K			S			H																													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron			Nodular cast iron			Malleable cast iron																									
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	130	130	230	130	230	130	130	230	130	230	130	130	230	130	230	130	230	130	230	130						
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎						

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 4 FLUTE with EXTENDED NECK

**GMF60** PLAIN SHANK  
**GMF61** FLAT SHANK

- ▶ Special flute geometry and multiple helix eliminate vibrations
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40

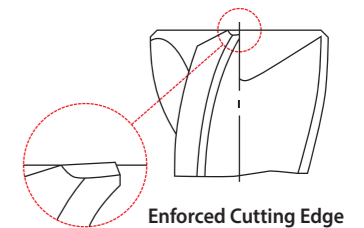


Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter	Chamfer
PLAIN	FLAT	D1	D2	L1	L3	L2	D3	
GMF60120	GMF61120	12.0	12	16	30	83	11.0	0.35
GMF60916	GMF61916	12.0	12	16	40	93	11.0	0.35
GMF60917	GMF61917	12.0	12	16	64	117	11.0	0.35
GMF60918	GMF61918	12.0	12	26	38	83	11.0	0.35
GMF60160	GMF61160	16.0	16	22	38	92	15.0	0.40
GMF60919	GMF61919	16.0	16	22	55	109	15.0	0.40
GMF60920	GMF61920	16.0	16	22	87	141	15.0	0.40
GMF60921	GMF61921	16.0	16	32	44	92	15.0	0.40
GMF60200	GMF61200	20.0	20	26	50	104	19.0	0.50
GMF60922	GMF61922	20.0	20	26	70	124	19.0	0.50
GMF60923	GMF61923	20.0	20	26	110	164	19.0	0.50
GMF60924	GMF61924	20.0	20	38	54	104	19.0	0.50

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
Up to Ø12	0 ~ -0.02
Over Ø12	0 ~ -0.03

h5  
\* Shank Dia. ≥ Ø12: h6



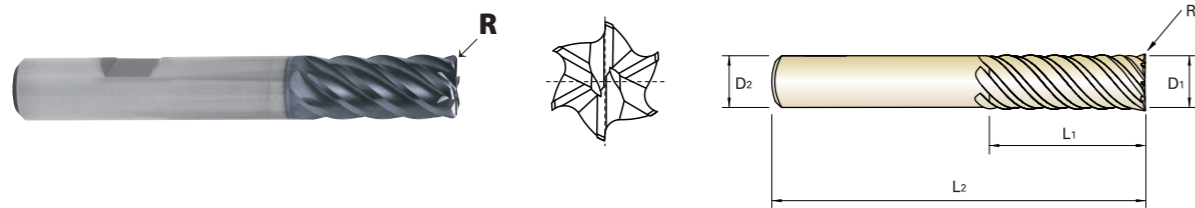
◎ : Excellent ○ : Good

ISO Material Description	P										M				K			S			H																													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel				Grey cast iron			Nodular cast iron			Malleable cast iron																									
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21						
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	130	230	130	230	130	130	230	130	230	130	130	230	130	230	130	130	230	130	230	130	230	130	230	130						
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎						

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS LONG LENGTH

**GMG16** PLAIN SHANK  
**GMG17** FLAT SHANK

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
GMG16060	GMG17060	R0.5	6.0	6	13	57
GMG16901	GMG17901	R1.0	6.0	6	13	57
GMG16080	GMG17080	R0.5	8.0	8	19	63
GMG16902	GMG17902	R1.0	8.0	8	19	63
GMG16100	GMG17100	R0.5	10.0	10	22	72
GMG16903	GMG17903	R1.0	10.0	10	22	72
GMG16904	GMG17904	R1.5	10.0	10	22	72
GMG16905	GMG17905	R2.0	10.0	10	22	72
GMG16120	GMG17120	R0.5	12.0	12	26	83
GMG16906	GMG17906	R1.0	12.0	12	26	83
GMG16907	GMG17907	R1.5	12.0	12	26	83
GMG16908	GMG17908	R2.0	12.0	12	26	83
GMG16909	GMG17909	R3.0	12.0	12	26	83
GMG16160	GMG17160	R1.0	16.0	16	32	92
GMG16910	GMG17910	R1.5	16.0	16	32	92
GMG16911	GMG17911	R2.0	16.0	16	32	92
GMG16912	GMG17912	R3.0	16.0	16	32	92
GMG16200	GMG17200	R1.0	20.0	20	38	104
GMG16913	GMG17913	R1.5	20.0	20	38	104
GMG16914	GMG17914	R2.0	20.0	20	38	104
GMG16915	GMG17915	R3.0	20.0	20	38	104
GMG16250	GMG17250	R1.0	25.0	25	44	104
GMG16916	GMG17916	R1.5	25.0	25	44	104
GMG16917	GMG17917	R2.0	25.0	25	44	104
GMG16918	GMG17918	R3.0	25.0	25	44	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia. ≥ Ø12: h6

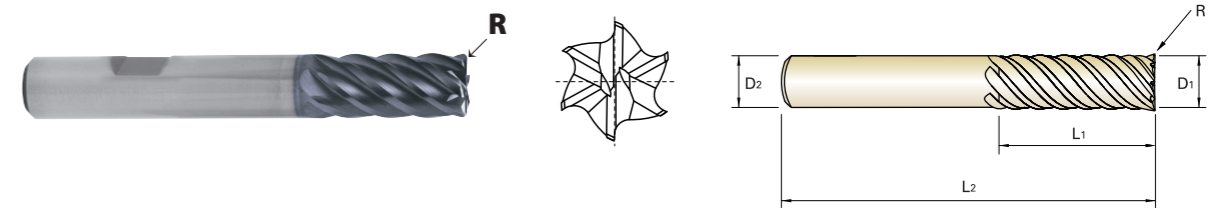
◎ : Excellent ○ : Good

ISO Material Description	P										M				K			S			H																													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron																					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
HRC	13	25	28	32	30	180	275	300	350	200	325	200	240	180	10	26	3	25	130	230											15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	550	630	400	550					
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	10	26	3	25	130	230											15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	550	630	400	550					
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH

**GMG18** PLAIN SHANK  
**GMG19** FLAT SHANK

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
GMG18060	GMG19060	R0.5	6.0	6	24	75
GMG18901	GMG19901	R1.0	6.0	6	24	75
GMG18080	GMG19080	R0.5	8.0	8	32	75
GMG18902	GMG19902	R1.0	8.0	8	32	75
GMG18903	GMG19903	R2.0	8.0	8	32	75
GMG18100	GMG19100	R0.5	10.0	10	40	100
GMG18904	GMG19904	R1.0	10.0	10	40	100
GMG18905	GMG19905	R1.5	10.0	10	40	100
GMG18906	GMG19906	R2.0	10.0	10	40	100
GMG18120	GMG19120	R0.5	12.0	12	48	120
GMG18907	GMG19907	R1.0	12.0	12	48	120
GMG18908	GMG19908	R1.5	12.0	12	48	120
GMG18909	GMG19909	R2.0	12.0	12	48	120
GMG18910	GMG19910	R3.0	12.0	12	48	120
GMG18160	GMG19160	R1.0	16.0	16	64	140
GMG18911	GMG19911	R1.5	16.0	16	64	140
GMG18912	GMG19912	R2.0	16.0	16	64	140
GMG18913	GMG19913	R3.0	16.0	16	64	140
GMG18200	GMG19200	R1.0	20.0	20	80	150
GMG18914	GMG19914	R1.5	20.0	20	80	150
GMG18915	GMG19915	R2.0	20.0	20	80	150
GMG18916	GMG19916	R3.0	20.0	20	80	150
GMG18917	GMG19917	R4.0	20.0	20	80	150

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
0 ~ - 0.03		h5
		* Shank Dia. ≥ Ø12: h6

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◎ : Excellent ○ : Good

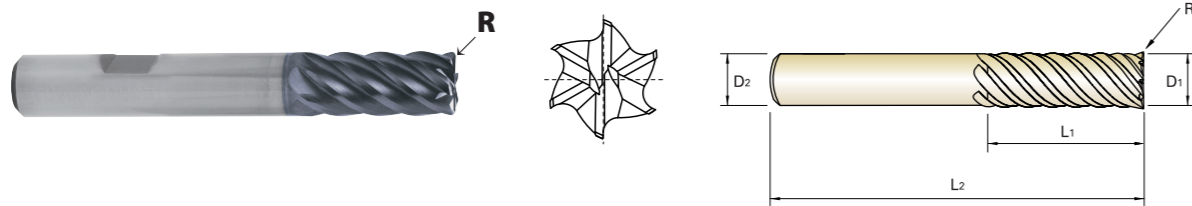
ISO Material Description	P										M				K			S			H																													
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron	Malleable cast iron		Heat Resistant Super Alloys			Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron																					
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
HRC	13	25	28	32	30	180	275	300	350	200	325	200	240	180	10	26	3	25	130	230											15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	550	630	400	550					
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	10	26	3	25	130	230											15	30	25	38	34	400 Rm	1050 Rm	55	60	42	55	550	630	400	550					
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎					



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH

**GMG18** PLAIN SHANK  
**GMG19** FLAT SHANK

- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
<b>GMG18918</b>	<b>GMG19918</b>	R5.0	<b>20.0</b>	20	80	150
<b>GMG18250</b>	<b>GMG19250</b>	R1.0	<b>25.0</b>	25	100	170
<b>GMG18919</b>	<b>GMG19919</b>	R1.5	<b>25.0</b>	25	100	170
<b>GMG18920</b>	<b>GMG19920</b>	R2.0	<b>25.0</b>	25	100	170
<b>GMG18921</b>	<b>GMG19921</b>	R3.0	<b>25.0</b>	25	100	170
<b>GMG18922</b>	<b>GMG19922</b>	R4.0	<b>25.0</b>	25	100	170
<b>GMG18923</b>	<b>GMG19923</b>	R5.0	<b>25.0</b>	25	100	170

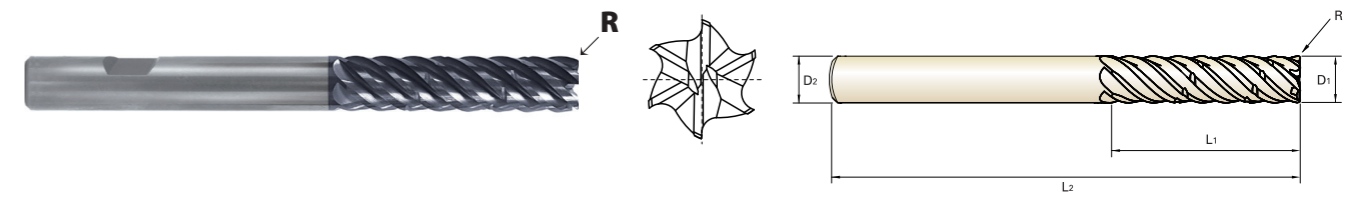
Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia. ≥ Ø12: h6

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH CHIP SPLITTER

**NEW**  
**GMH58** PLAIN SHANK  
**GMH59** FLAT SHANK

Launching Jan of 2020

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
<b>GMH58060</b>	<b>GMH59060</b>	R0.5	<b>6.0</b>	6	24	75
<b>GMH58901</b>	<b>GMH59901</b>	R1.0	<b>6.0</b>	6	24	75
<b>GMH58080</b>	<b>GMH59080</b>	R0.5	<b>8.0</b>	8	32	75
<b>GMH58902</b>	<b>GMH59902</b>	R1.0	<b>8.0</b>	8	32	75
<b>GMH58903</b>	<b>GMH59903</b>	R2.0	<b>8.0</b>	8	32	75
<b>GMH58100</b>	<b>GMH59100</b>	R0.5	<b>10.0</b>	10	40	100
<b>GMH58904</b>	<b>GMH59904</b>	R1.0	<b>10.0</b>	10	40	100
<b>GMH58905</b>	<b>GMH59905</b>	R1.5	<b>10.0</b>	10	40	100
<b>GMH58906</b>	<b>GMH59906</b>	R2.0	<b>10.0</b>	10	40	100
<b>GMH58120</b>	<b>GMH59120</b>	R0.5	<b>12.0</b>	12	48	120
<b>GMH58907</b>	<b>GMH59907</b>	R1.0	<b>12.0</b>	12	48	120
<b>GMH58908</b>	<b>GMH59908</b>	R1.5	<b>12.0</b>	12	48	120
<b>GMH58909</b>	<b>GMH59909</b>	R2.0	<b>12.0</b>	12	48	120
<b>GMH58910</b>	<b>GMH59910</b>	R3.0	<b>12.0</b>	12	48	120
<b>GMH58160</b>	<b>GMH59160</b>	R1.0	<b>16.0</b>	16	64	140
<b>GMH58911</b>	<b>GMH59911</b>	R1.5	<b>16.0</b>	16	64	140
<b>GMH58912</b>	<b>GMH59912</b>	R2.0	<b>16.0</b>	16	64	140
<b>GMH58913</b>	<b>GMH59913</b>	R3.0	<b>16.0</b>	16	64	140
<b>GMH58200</b>	<b>GMH59200</b>	R1.0	<b>20.0</b>	20	80	150
<b>GMH58914</b>	<b>GMH59914</b>	R1.5	<b>20.0</b>	20	80	150
<b>GMH58915</b>	<b>GMH59915</b>	R2.0	<b>20.0</b>	20	80	150

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia. ≥ Ø12: h6

▶ NEXT PAGE

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	45	15	23	10	10	26	3	25	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	45	15	23	10	10	26	3	25	25	21	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N				S						H										
	Aluminum-wrought alloy		Aluminum-cast, alloyed		Copper and Copper Alloys (Bronze / Brass)		Non Metallic Materials		Heat Resistant Super Alloys				Titanium Alloys		Hardened steel	Chilled Cast Iron	Hardened Cast Iron				
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	15	30	25	38	34	15	30	25	38	34	15	30	25	38	34	55	60	42	42	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE CORNER RADIUS EXTRA LONG LENGTH CHIP SPLITTER

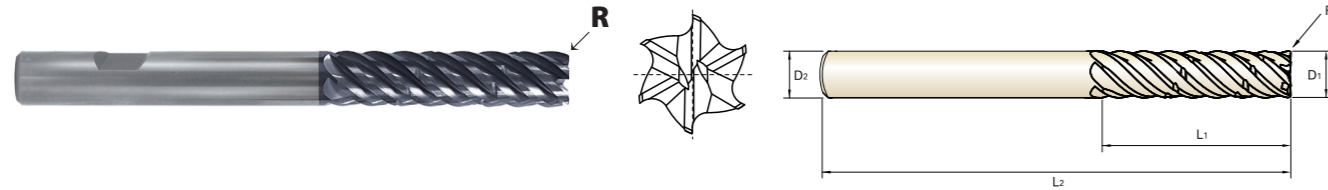
NEW

**GMH58** PLAIN SHANK

**GMH59** FLAT SHANK

Launching Jan of 2020

- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	R	D1	D2	L1	L2
<b>GMH58916</b>	<b>GMH59916</b>	R3.0	<b>20.0</b>	20	80	150
<b>GMH58917</b>	<b>GMH59917</b>	R4.0	<b>20.0</b>	20	80	150
<b>GMH58918</b>	<b>GMH59918</b>	R5.0	<b>20.0</b>	20	80	150
<b>GMH58250</b>	<b>GMH59250</b>	R1.0	<b>25.0</b>	25	100	170
<b>GMH58919</b>	<b>GMH59919</b>	R1.5	<b>25.0</b>	25	100	170
<b>GMH58920</b>	<b>GMH59920</b>	R2.0	<b>25.0</b>	25	100	170
<b>GMH58921</b>	<b>GMH59921</b>	R3.0	<b>25.0</b>	25	100	170
<b>GMH58922</b>	<b>GMH59922</b>	R4.0	<b>25.0</b>	25	100	170
<b>GMH58923</b>	<b>GMH59923</b>	R5.0	<b>25.0</b>	25	100	170

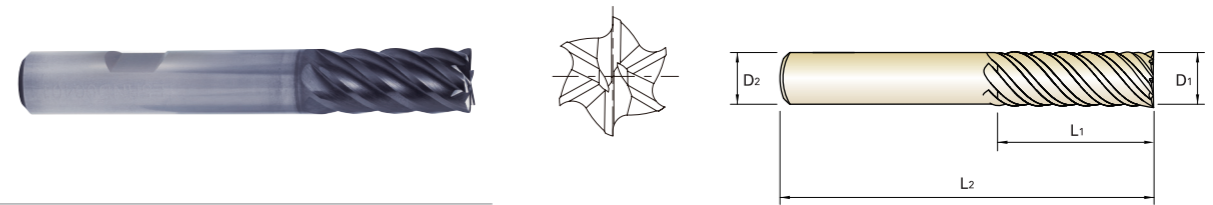
Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia. ≥ Ø12: h6

## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE LONG LENGTH

**GMG12** PLAIN SHANK

**GMG13** FLAT SHANK

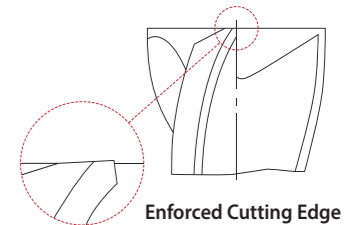
- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
PLAIN	FLAT	D1	D2	L1	L2
<b>GMG12060</b>	<b>GMG13060</b>	<b>6.0</b>	6	13	57
<b>GMG12080</b>	<b>GMG13080</b>	<b>8.0</b>	8	19	63
<b>GMG12100</b>	<b>GMG13100</b>	<b>10.0</b>	10	22	72
<b>GMG12120</b>	<b>GMG13120</b>	<b>12.0</b>	12	26	83
<b>GMG12160</b>	<b>GMG13160</b>	<b>16.0</b>	16	32	92
<b>GMG12200</b>	<b>GMG13200</b>	<b>20.0</b>	20	38	104
<b>GMG12250</b>	<b>GMG13250</b>	<b>25.0</b>	25	44	104

Mill Dia. Tolerance (mm)		Shank Dia. Tolerance
Up to Ø12	0 ~ - 0.02	h5
Over Ø12	0 ~ - 0.03	* Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N			S						H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34								55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC		13	25	28	32	10	29	32	38	15	35	15	23	10	10	26	3	25		21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

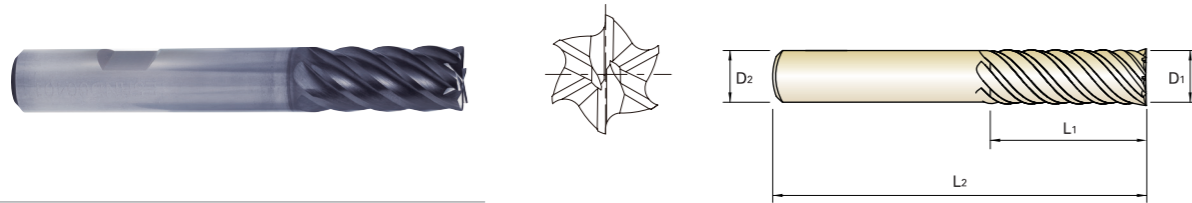
ISO Material Description	N			S						H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Hardened steel	Chilled Cast Iron	Hardened Cast Iron						
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC						15	30	25	38	34								55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended						○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○



## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE EXTRA LONG LENGTH

**GMG14** PLAIN SHANK  
**GMG15** FLAT SHANK

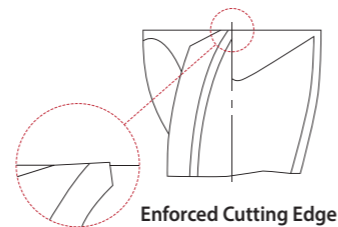
- ▶ The unique geometry of the variable pitch provides the best chatter free tool for high speed and trochoidal milling
- ▶ Excellent performance for Stainless Steels, Mild Steels, Cast Iron, Low/Medium hardness materials under HRC40



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut		Overall Length
PLAIN	FLAT	D1	D2	L1	L2	
<b>GMG14060</b>	<b>GMG15060</b>	<b>6.0</b>	6	24	75	
<b>GMG14080</b>	<b>GMG15080</b>	<b>8.0</b>	8	32	75	
<b>GMG14100</b>	<b>GMG15100</b>	<b>10.0</b>	10	40	100	
<b>GMG14120</b>	<b>GMG15120</b>	<b>12.0</b>	12	48	120	
<b>GMG14160</b>	<b>GMG15160</b>	<b>16.0</b>	16	64	140	
<b>GMG14200</b>	<b>GMG15200</b>	<b>20.0</b>	20	80	150	
<b>GMG14250</b>	<b>GMG15250</b>	<b>25.0</b>	25	100	170	

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N			S						H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

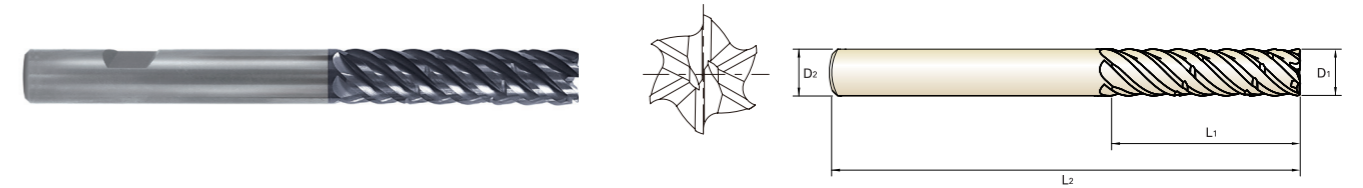


## HIGH PERFORMANCE SOLID CARBIDE END MILLS 6 FLUTE EXTRA LONG LENGTH CHIP SPLITTER

**NEW**  
**GMH56** PLAIN SHANK  
**GMH57** FLAT SHANK

Launching Jan of 2020

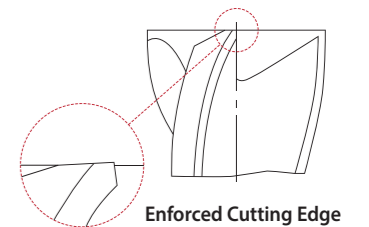
- ▶ Special chip splitter design for better chip removal shortened chip length at high axial machining
- ▶ High Performance for Steels, Stainless Steels and Cast Iron



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut		Overall Length
PLAIN	FLAT	D1	D2	L1	L2	
<b>GMH56060</b>	<b>GMH57060</b>	<b>6.0</b>	6	24	75	
<b>GMH56080</b>	<b>GMH57080</b>	<b>8.0</b>	8	32	75	
<b>GMH56100</b>	<b>GMH57100</b>	<b>10.0</b>	10	40	100	
<b>GMH56120</b>	<b>GMH57120</b>	<b>12.0</b>	12	48	120	
<b>GMH56160</b>	<b>GMH57160</b>	<b>16.0</b>	16	64	140	
<b>GMH56200</b>	<b>GMH57200</b>	<b>20.0</b>	20	80	150	
<b>GMH56250</b>	<b>GMH57250</b>	<b>25.0</b>	25	100	170	

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ - 0.03	h5 * Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO Material Description	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	38	10	29	32	38	15	35	15	23	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	

ISO Material Description	N			S						H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
VDI 3323	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	60	100	75	90	130	110	90	100			15	30	25	38	34	55	60	42	55	55	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	○	○				

# HIGH PERFORMANCE SOLID CARBIDE END MILLS 5 FLUTE LONG LENGTH

**EMB72** PLAIN SHANK  
**EMB73** FLAT SHANK

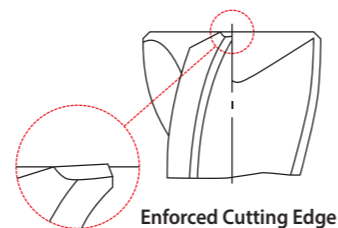
- ▶ Special flute geometry eliminates vibrations
- ▶ Designed for mild steels, stainless steels, cast iron, tool steels, titanium alloys, prehardened steels and low hardness materials under HRC40
- ▶ Excellent finished work piece
- ▶ Higher speeds, deeper cuts and excellent metal removal rates



Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length	Chamfer
PLAIN	FLAT	D1	D2	L1	L2	
<b>EMB72060</b>	<b>EMB73060</b>	<b>6.0</b>	6	13	57	0.1
<b>EMB72080</b>	<b>EMB73080</b>	<b>8.0</b>	8	19	63	0.1
<b>EMB72100</b>	<b>EMB73100</b>	<b>10.0</b>	10	22	72	0.1
<b>EMB72120</b>	<b>EMB73120</b>	<b>12.0</b>	12	26	83	0.1
<b>EMB72140</b>	<b>EMB73140</b>	<b>14.0</b>	14	26	83	0.2
<b>EMB72160</b>	<b>EMB73160</b>	<b>16.0</b>	16	32	92	0.2
<b>EMB72180</b>	<b>EMB73180</b>	<b>18.0</b>	18	32	92	0.2
<b>EMB72200</b>	<b>EMB73200</b>	<b>20.0</b>	20	38	104	0.2
<b>EMB72250</b>	<b>EMB73250</b>	<b>25.0</b>	25	38	104	0.2

Mill Dia. Tolerance (mm)	Shank Dia. Tolerance
0 ~ -0.03	h5 * Shank Dia. ≥ Ø12: h6



◎ : Excellent ○ : Good

ISO	P										M				K						
	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron
Material Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
VDI 3323																					
HRc	13	25	28	32	30	29	32	38	35	35	15	23	10	10	10	26	3	25	130	21	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommended	◎	◎	○	○	○	◎	○	○	○	◎	○	◎	◎	◎	○	○	○	○	○	○	

ISO	N			S						H											
	Aluminum-wrought alloy		Aluminum-cast, alloyed	Copper and Copper Alloys (Bronze / Brass)			Non Metallic Materials			Heat Resistant Super Alloys			Titanium Alloys	Hardened steel	Chilled Cast Iron	Hardened Cast Iron					
Material Description	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
VDI 3323																					
HRc											15	30	25	38	34			55	60	42	55
HB	60	100	75	90	130	110	90	100			200	280	250	350	320	400 Rm	1050 Rm	550	630	400	550
Recommended											○	○	○	○	○	◎	◎				

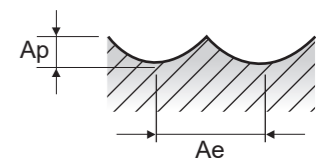
# RECOMMENDED CUTTING CONDITIONS

## GMG55, GMG56 SERIES

### 4 FLUTE BALL NOSE

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)												
						3.0	4.0	5.0	6.0	8.0	10.0	12.0	16.0	18.0	20.0	25.0		
P	1-4	Non-alloy steel	0.5D	1.0D	Vc	162	162	162	162	162	162	162	162	162	162	162	162	162
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.075	0.08	0.09	0.099		
					RPM	17189	12892	10313	8594	6446	5157	4297	3223	2865	2578	2063		
	5	Low alloy steel	0.5D	1.0D	Vc	113	113	113	113	113	113	113	113	113	113	113	113	113
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.074	0.079	0.09	0.099		
					RPM	11990	8992	7194	5995	4496	3597	2997	2248	1998	1798	1439		
	6-7	High alloyed steel, and tool steel	0.5D	1.0D	Vc	162	162	162	162	162	162	162	162	162	162	162	162	
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.074	0.079	0.09	0.099		
					RPM	17189	12892	10313	8594	6446	5157	4297	3223	2865	2578	2063		
	8-9	Stainless steel	0.5D	1.0D	Vc	113	113	113	113	113	113	113	113	113	113	113	113	
					fz	0.025	0.027	0.03	0.04	0.06	0.065	0.07	0.074	0.079	0.09	0.099		
					RPM	11990	8992	7194	5995	4496	3597	2997	2248	1998	1798	1439		
10-11.1	Grey cast iron	0.5D	1.0D	Vc	68	68	68	68	68	68	68	68	68	68	68	68		
				fz	0.017	0.019	0.021	0.028	0.042	0.045	0.049	0.052	0.056	0.063	0.07			
				RPM	7215	5411	4329	3608	2706	2165	1804	1353	1203	1082	866			
M	12-13	Heat Resistant Super Alloys	0.5D	1.0D	Vc	77	77	77	77	77	77	77	77	77	77	77	77	
					fz	0.015	0.015	0.025	0.03	0.04	0.045	0.05	0.054	0.059	0.058	0.059		
					RPM	8170	6127	4902	4085	3064	2451	2042	1532	1362	1225	980		
	14.1	Titanium Alloys	0.5D	1.0D	Vc	85	85	85	85	85	85	85	85	85	85	85	85	
					fz	0.02	0.02	0.025	0.041	0.045	0.05	0.055	0.06	0.064	0.065	0.068		
					RPM	9019	6764	5411	4509	3382	2706	2255	1691	1503	1353	1082		
	14.2	Titanium Alloys	0.5D	1.0D	Vc	77	77	77	77	77	77	77	77	77	77	77	77	
					fz	0.02	0.02	0.025	0.041	0.045	0.05	0.055	0.06	0.064	0.065	0.068		
					RPM	8170	6127	4902	4085	3064	2451	2042	1532	1362	1225	980		
	K	15-20	Titanium Alloys	0.5D	1.0D	Vc	119	119	119	119	119	119	119	119	119	119	119	119
						fz	0.031	0.033	0.037	0.05	0.074	0.081	0.087	0.093	0.099	0.112	0.124	
						RPM	12626	9470	7576	6313	4735	3788	3157	2367	2104	1894	1515	
31-35		Titanium Alloys	0.2D	0.3D	Vc	1566	1250	1121	1263	1402	1227	1098	881	833	848	752		
					fz	0.014	0.014	0.017	0.028	0.031	0.035	0.038	0.042	0.045	0.045	0.048		
					RPM	2228	1671	1337	1114	836	668	557	418	371	334	267		
36-37		Titanium Alloys	0.5D	0.3D	Vc	21	21	21	21	21	21	21	21	21	21	21	21	
					fz	0.018	0.018	0.022	0.037	0.04	0.045	0.049	0.054	0.058	0.058	0.061		
					RPM	4987	3740	2992	2493	1870	1496	1247	935	831	748	598		





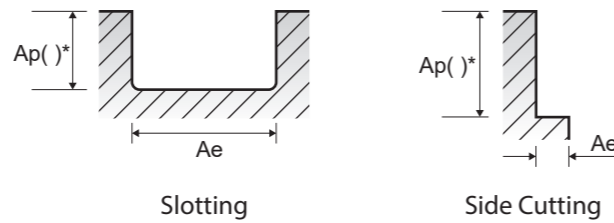
**GMF52, GMF54, GMF56, GMF58, GMF60, GMF62, GMF53, GMF55, GMF57, GMF59, GMF61, GMF63 SERIES**

**4 FLUTE - SIDE & SLOTTING**

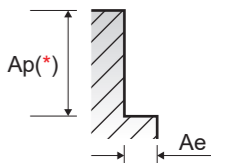
Vc = m/min. fz = mm/tooth  
RPM = rev./min. FEED = mm/min.

ISO	VDI 3323	Material Description	Ae		Ap		Parameter	Diameter (Ø)												
			Side	Slotting	Side	Slotting		3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	
P	1-4	Non-alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	152	152	152	152	152	168	168	168	168	168	168	168	168
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064	
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139	
	5	Low alloy steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	107	107	107	107	107	117	117	117	117	117	117	117	
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064	
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490	
	6-7	High alloyed steel, and tool steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	152	152	152	152	152	168	168	168	168	168	168	168	
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064	
							RPM	16128	12096	9677	8064	6048	5348	4456	3820	3342	2971	2674	2139	
	8-9	Stainless steel	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	107	107	107	107	107	117	117	117	117	117	117	117	
							fz	0.005	0.008	0.011	0.016	0.027	0.038	0.047	0.049	0.053	0.059	0.065	0.064	
							RPM	11353	8515	6812	5677	4257	3724	3104	2660	2328	2069	1862	1490	
10-11.1	Grey cast iron	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	64	64	64	64	64	70	70	70	70	70	70	70		
						fz	0.003	0.006	0.008	0.011	0.019	0.027	0.032	0.034	0.037	0.041	0.045	0.045		
						RPM	6791	5093	4074	3395	2546	2228	1857	1592	1393	1238	1114	891		
M	12-13	Heat Resistant Super Alloys	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	148	148	148	148	148	148	148	148	148	148	148		
							fz	0.004	0.006	0.009	0.013	0.022	0.034	0.039	0.042	0.045	0.05	0.055	0.055	
							RPM	15703	11777	9422	7852	5889	4711	3926	3365	2944	2617	2355	1884	
	14.1	Titanium Alloys	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	106	106	106	106	106	106	106	106	106	106	106		
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.059	0.062	0.07	0.077	0.077	
							RPM	11247	8435	6748	5623	4218	3374	2812	2410	2109	1874	1687	1350	
	14.2	Titanium Alloys	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	95	95	95	95	95	95	95	95	95	95	95		
							fz	0.005	0.008	0.013	0.018	0.028	0.048	0.055	0.059	0.062	0.069	0.076	0.076	
							RPM	10080	7560	6048	5040	3780	3024	2520	2160	1890	1680	1512	1210	
	K	15-20	Titanium Alloys	0.5D	1.0D	1.5D (1.2D)	1.0D (0.8D)	Vc	112	112	112	112	112	123	123	123	123	123	123	
								fz	0.006	0.01	0.014	0.02	0.034	0.048	0.058	0.061	0.065	0.073	0.081	0.079
								RPM	11884	8913	7130	5942	4456	3915	3263	2797	2447	2175	1958	1566
31-35		Heat Resistant Super Alloys	0.25D	1.0D	1.0D	0.5D	Vc	26	26	26	26	26	26	26	26	26	26	26		
							fz	0.005	0.007	0.008	0.012	0.019	0.033	0.038	0.04	0.043	0.048	0.054	0.052	
							RPM	2759	2069	1655	1379	1035	828	690	591	517	460	414	331	
36-37		Titanium Alloys	0.4D	1.0D	1.0D	0.5D	Vc	58	58	58	58	58	58	58	58	58	58	58		
							fz	0.004	0.007	0.011	0.016	0.025	0.042	0.05	0.053	0.055	0.062	0.068	0.069	
							RPM	6154	4615	3692	3077	2308	1846	1538	1319	1154	1026	923	738	

\*( ): Short length & Neck type



(\*) : If product's Length of Cut(L.O.C) is below 2D, it must be applied L.O.C x 90%



**GMG16, GMG18, GMG12, GMG14, GMG17, GMG19, GMG13, GMG15 SERIES**

**6 FLUTE - SIDE CUTTING**

Vc = m/min. fz = mm/tooth  
RPM = rev./min. FEED = mm/min.

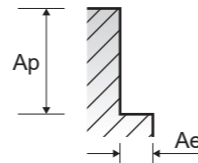
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6.0	8.0	10.0	12.0	16.0	20.0	25.0	
P	1-4	Non-alloy steel	0.05D	2.0D	Vc	300	300	300	300	300	300	300	
					fz	0.068	0.116	0.144	0.173	0.202	0.225	0.232	
					RPM	15915	11937	9549	7958	5968	4775	3820	
	5	Low alloy steel	0.05D	2.0D	Vc	203	203	203	203	203	203	203	
					fz	0.05	0.085	0.106	0.128	0.149	0.167	0.174	
					RPM	10769	8077	6462	5385	4039	3231	2585	
	6-7	High alloyed steel, and tool steel	0.05D	2.0D	Vc	300	300	300	300	300	300	300	
					fz	0.068	0.116	0.144	0.173	0.202	0.225	0.232	
					RPM	15915	11937	9549	7958	5968	4775	3820	
	8-9	Stainless steel	0.05D	2.0D	Vc	203	203	203	203	203	203	203	
					fz	0.05	0.085	0.106	0.128	0.149	0.167	0.174	
					RPM	10769	8077	6462	5385	4039	3231	2585	
10-11.1	Titanium Alloys	0.05D	2.0D	Vc	100	100	100	100	100	100	100		
				fz	0.041	0.071	0.088	0.105	0.123	0.137	0.144		
				RPM	5305	3979	3183	2653	1989	1592	1273		
M	12-13	Heat Resistant Super Alloys	0.05D	2.0D	Vc	213	213	213	213	213	213	213	
					fz	0.049	0.084	0.104	0.125	0.146	0.162	0.168	
					RPM	11300	8475	6780	5650	4238	3390	2712	
	14.1	Titanium Alloys	0.05D	2.0D	Vc	147	147	147	147	147	147	147	
					fz	0.041	0.071	0.088	0.105	0.123	0.137	0.143	
					RPM	7799	5849	4679	3899	2924	2340	1872	
	14.2	Titanium Alloys	0.05D	2.0D	Vc	134	134	134	134	134	134	134	
					fz	0.041	0.071	0.088	0.105	0.123	0.137	0.142	
					RPM	7109	5332	4265	3554	2666	2133	1706	
	S	31-35	Heat Resistant Super Alloys	0.05D	2.0D	Vc	33	33	33	33	33	33	33
						fz	0.033	0.055	0.07	0.082	0.097	0.112	0.115
						RPM	1751	1313	1050	875	657	525	420
36-37		Titanium Alloys	0.05D	2.0D	Vc	116	116	116	116	116	116	116	
					fz	0.033	0.055	0.07	0.083	0.097	0.113	0.117	
					RPM	6154	4615	3692	3077	2308	1846	1477	

**GMH58, GMH59,  
GMH56, GMH57 SERIES**

**6 FLUTE CHIP SPLITTER - SIDE CUTTING**

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6.0	8.0	10.0	12.0	16.0	20.0	25.0	
P	1-4	Non-alloy steel	0.05D	3.0D	Vc	270	270	270	270	270	270	270	
					fz	0.034	0.058	0.072	0.087	0.101	0.113	0.116	
					RPM	14324	10743	8594	7162	5371	4297	3438	
	5	Low alloy steel	0.05D	3.0D	Vc	182.7	182.7	182.7	182.7	182.7	182.7	182.7	
					fz	0.025	0.043	0.053	0.064	0.075	0.084	0.087	
					RPM	9693	7269	5816	4846	3635	2908	2326	
	6-7	Low alloy steel	0.05D	3.0D	Vc	270	270	270	270	270	270	270	
					fz	0.034	0.058	0.072	0.087	0.101	0.113	0.116	
					RPM	14324	10743	8594	7162	5371	4297	3438	
	8-9	Low alloy steel	0.05D	3.0D	Vc	182.7	182.7	182.7	182.7	182.7	182.7	182.7	
					fz	0.025	0.043	0.053	0.064	0.075	0.084	0.087	
					RPM	9693	7269	5816	4846	3635	2908	2326	
10-11.1	High alloyed steel, and tool steel	0.05D	3.0D	Vc	90	90	90	90	90	90	90		
				fz	0.021	0.036	0.044	0.053	0.062	0.069	0.072		
				RPM	4775	3581	2865	2387	1790	1432	1146		
M	12-13	Stainless steel	0.05D	3.0D	Vc	191.7	191.7	191.7	191.7	191.7	191.7	191.7	
					fz	0.025	0.042	0.052	0.063	0.073	0.081	0.084	
					RPM	10170	7628	6102	5085	3814	3051	2441	
	14.1	Stainless steel	0.05D	3.0D	Vc	132.3	132.3	132.3	132.3	132.3	132.3	132.3	
					fz	0.021	0.036	0.044	0.053	0.062	0.069	0.072	
					RPM	7019	5264	4211	3509	2632	2106	1684	
	14.2	Stainless steel	0.05D	3.0D	Vc	120.6	120.6	120.6	120.6	120.6	120.6	120.6	
					fz	0.021	0.036	0.044	0.053	0.062	0.069	0.071	
					RPM	6398	4799	3839	3199	2399	1919	1536	
	S	31-35	Heat Resistant Super Alloys	0.05D	3.0D	Vc	29.7	29.7	29.7	29.7	29.7	29.7	29.7
						fz	0.017	0.028	0.035	0.041	0.049	0.056	0.058
						RPM	1576	1182	945	788	591	473	378
36-37		Titanium Alloys	0.05D	3.0D	Vc	104.4	104.4	104.4	104.4	104.4	104.4	104.4	
					fz	0.017	0.028	0.035	0.042	0.049	0.057	0.059	
					RPM	5539	4154	3323	2769	2077	1662	1329	



**EMB72, EMB73 SERIES**

**5 FLUTE - SIDE CUTTING**

Vc = m/min.      fz = mm/tooth  
RPM = rev./min.      FEED = mm/min.

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Diameter (Ø)							
						6.0	8.0	10.0	12.0	14.0	16.0	20.0	
P	1-2	Non-alloy steel	0.25D	1.25D	Vc	135	135	135	135	135	135	135	
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089	
					RPM	7162	5371	4297	3581	3069	2686	2149	
	6	Low alloy steel	0.25D	1.25D	Vc	135	135	135	135	135	135	135	
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089	
					RPM	7162	5371	4297	3581	3069	2686	2149	
	10	High alloyed steel, and tool steel	0.25D	1.25D	Vc	135	135	135	135	135	135	135	
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089	
					RPM	7162	5371	4297	3581	3069	2686	2149	
	M	12-13	Stainless steel	0.25D	1.25D	Vc	105	105	105	145	105	105	105
						fz	0.030	0.032	0.038	0.043	0.064	0.068	0.076
						RPM	5570	4178	3342	3846	2387	2089	1671
14.1		Stainless steel	0.25D	1.25D	Vc	115	115	115	115	115	115	115	
					fz	0.030	0.032	0.038	0.063	0.065	0.069	0.076	
					RPM	6101	4576	3661	3050	2615	2288	1830	
K	15-20	Grey cast iron	0.25D	1.25D	Vc	135	135	135	135	135	135	135	
					fz	0.034	0.038	0.050	0.063	0.069	0.076	0.089	
					RPM	7162	5371	4297	3581	3069	2686	2149	
	31-35	Heat Resistant Super Alloys	0.25D	1.0D	Vc	25	25	25	25	25	25	25	
					fz	0.017	0.020	0.025	0.036	0.045	0.048	0.060	
					RPM	1326	995	796	663	568	497	398	
36-37	Titanium Alloys	0.25D	1.25D	Vc	85	85	85	85	85	85	85		
				fz	0.030	0.031	0.038	0.050	0.057	0.063	0.075		
				RPM	4509	3382	2706	2255	1933	1691	1353		

